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AUTHOR	Ediger, Marlow
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ABSTRACT

Journal writing in science can be productive and stress basic skills. Students need to be highly motivated to engage in journal writing, and since the world of science fascinates most learners, chances for motivation are good. The subject matter to be written about needs to relate directly to the ongoing unit of study. Dramatizations, both formal and creative, can have students writing play parts from printed script such as the basal text. The author/educator supervised student teachers in the public schools for 30 years and enjoyed a fine dramatization by four sixth grade students involved in studying a unit on "Famous Scientists in the World." A cooperating teacher and student teacher supervised by the educator/author assisted a committee of four who made a model farm scene showing different methods of soil conservation. A basal for science can provide many ideas for journal writing, as can library books selected to relate directly to the science unit being taught. Improved understanding of science as well as better writing skills should be an end result of journal writing. (NKA)

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Student Journal Writing in Science.

by Marlow Ediger

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CS 217 345

M. Ediger

STUDENT JOURNAL WRITING IN SCIENCE

Students need to communicate effectively in the science curriculum. There are a plethora of learning opportunities in science involving written work. Journal writing is one of these avenues. Journal writing in science can be productive, enjoyable, stress basic skills, and be related directly to a hands on approach in learning.

Individual differences need to be considered when assessing student achievement in journal writing. To be sure, selected students do a much better job of writing clearly and concisely in class, than do others. Students need to achieve as optimally as possible in writing so that readers may understand and comprehend contents readily and accurately. Each student then should be assessed based on making improvement as compared to previous journal entries written, rather than achieving absolute standards. Absolute standards emphasize the same achievement level for all in journal writing. This would be unfair since a student cannot overnight become a good writer. But, each student can improve over previous levels of personal achievement. High standards for all should be expected from each student. The standards are then challenging, but achievable.

Quality written communication in science is important for the student as well as for the professional scientist. Scientists do read and benefit from the work of others. Thus, students in he public schools should also be able to read and communicate well in the scientific arena (Ediger, 1999, 37-46).

Motivation for Journal Writing

Students need to be highly motivated to engage in journal writing. The world of science fascinates most learners, and each student should desire to be actively involved in journal writing. There must be much leeway for the student to choose topics to write on. The subject matter to be written needs to relate directly to the ongoing science unit of study.

Experimentation emphasizes a hands on approach in science learning. Each experiment should be

1. clearly visible to students.
2. on the developmental level of participants.
3. meaningful to learners.
4. interesting to participants.
5. quality in sequence within ongoing lessons and units of study in science.

A colleague may appraise the involved teacher in the five above named criteria using a five point Likert Scale.

With background information from an experiment, a student may

choose to write journal entries on what was learned. As an example in a unit pertaining to "Weather and How it Affects Us," the student individually or collaboratively may write the following from the just completed science experiment:

1. a hard boiled, peeled egg was placed on the opening of a gallon glass milk jug. Tissue paper was lit and placed below the hard boiled egg and inside the gallon jug. It was exciting to notice how the wider egg was sucked into the jug. The lesser air pressure inside the jug forced the egg through the narrow opening. A "swooshing" sound was made as the egg was forced through the narrow opening. I never realized how powerful air pressure is until this experiment was performed. The next experiment was equally exciting.

2. a dry, clean tissue paper was placed inside a glass tumbler. The tumbler was turned upside down in the aquarium which was filled with water. I hypothesized that the tissue paper would get soaking wet since the water level was higher than the upside down tumbler. But to my astonishment, the paper tissue was as dry as could be when taking it out of the aquarium and then out of the tumbler. A carefully designed, five point rubric may be used to rate each journal entry.

Each of the five levels from the poorest to the best should have descriptions pertaining to what is wanted to meet an expectation level (Ediger, 2000, 503-505).

Art Work and Journal Writing in Science

Student individually or in cooperative learning experiences may choose to develop an art project to indicate what was learned in the unit, "Weather and How IT Affects Us." Perhaps the art project emphasizes different kinds of clouds in the atmosphere. The following journal entry may be written pertaining to cloud formations:

1. after studying diverse clouds as they appear from the earth, we drew cumulus, cirrus, and stratus clouds. Each was clearly labeled and a brief explanation for each cloud formation was written and appeared under the designated drawing.

2. we developed a five point scale with an appropriate description for each expectation level was clearly written. This rubric was used for both the drawings and the decorations. I leaned a lot about expectations for the drawing and related descriptions by helping to develop the rubric.

3. I was surprised to learn that drawings could show what had been learned in science. The teacher listed intelligences which might be possessed by students. Art work was one of these listed intelligences (See Gardner, (1993).

Dramatizations, Science and Journal Writing

Formal dramatization emphasize students writing play parts from printed script such as the basal text. A committee of learners might volunteer to write these parts. The written parts may either be memorized or read from the script in presenting the formal dramatization to peers.

Creative dramatizations are different in that they stress no writing of play parts but that students secure adequate background information to present creatively the play to classmates. Each of these two dramatizations have values in guiding students to achieve vital objectives in science. Formal dramatics as the name indicates has a form or structure, that is the play parts can be memorized or read aloud. Whereas, creative dramatics provides opportunities for students to be spontaneous, novel, and unique in subject matter dramatized. A third form, pantomime, emphasizes students dramatizing with no spoken words involved. Here, learners realize how difficult it is to communicate with non-verbal communication. Movement, motion, and manual dexterity is inherent in pantomime.

The author supervised student teachers in the pubic schools for thirty years. One of the finest dramatization presented by four sixth grade students involved studying a unit on, "Famous Scientists in the World." The formal dramatization indicated what these students had learned about Louis Pasteur and his times. Each participant had the subject matter to be read well in mind. Much effort went into writing the play parts. The formal dramatization was presented in two other classrooms.

Journal writing here might well include the following as provided by a student:

1. our committee divided up into writing play parts for the following in the life and times of Louis Pasteur:

   a) one person wrote play parts abut the childhood years noting interesting happenings about Pasteur.

   b) a second person wrote play parts for the early adult years of this famous scientist, focusing upon scientific interests possessed by Louis Pasteur.

   c) a third student's responsibilities involved writing script for the productive years of Louis Pasteur's work in developing theories in science.

2. our committee then practiced reading aloud their respective role parts in the play. We practiced the play several times and then presented it to our class.

3. we were pleased to present the play to two other classrooms. Video-taping and watching ourselves on the monitor was truly a highlight of our dramatization! (Ediger, 2000, 41-46).

Journal Writing and Construction Activities in Science

Construction activities can provide excellent experiences for students. Each project needs to have a purpose. Thus, learners involved in a construction experience should have reasons for doing so. The purpose needs to be followed by plans to pursue the activity. The plans might then be implemented and the completed project assessed in terms of quality criteria. A cooperating teacher and student teacher in the public schools supervised by the author assisted a committee of four who made a model farm scene showing methods of soil conservation.Methods shown on the model emphasized terracing, strip cropping, seeding of grass, developing a grassed water way, and planting trees. Artificial trees were used in the model due to its size. which made actual tree planting impossible. In the ongoing science unit of study, the model and related research provided background information in writing the following journal entries:

1. soil erosion takes precious top soil away from being used to raise whet, corn, soybeans, and other agricultural products. Conservation practices need to be used immediately to promote saving of top soil. Terraces, strip cropping, as well as seeding of grass and trees, help conserve top soil for future generations in raising an adequate amount of farm produce to feed the world's population.
2. students in school can be advocates of soil conservation by being knowledgeable and finding ways of communicating these ideas to the lay public. All in society can do this, among other ways, by writing letters to the editor and through personal oral communication with others.
3. a computer brochure, with involved color, was made to show diverse approaches in soil conservation. Each student in class took a brochure home for parental viewing (Ediger, 2000, 210-211).

Reading From the Basal Science Textbook

There are a plethora of ideas which can be read from a basal which provide content for journal writing. In a sixth grade class in the public school in which the author supervised a student and cooperating teacher. A committee of three learners cooperatively wrote the following from reading the basal in an ongoing science unit on prehistoric life:

1. there are numerous disagreements on dinosaurs among scientists as to their being warm or cold blooded. We find this to be an interesting area of study and are doing much reading on this topic from different reference books, the internet, and the World Wide Web. We are comparing older with newer scientific data sources on this topic.
2. our committee decided that more information is needed on new discoveries pertaining to woolly mammoths and mastodons. With nearly

complete skeletons found on the woolly mammoth and possibilities for cloning, our committee felt that time should be spent on keeping abreast of current trends in this area.

3. we like to branch out on our own, within the science lesson/unit, to raise problems areas and find needed information for possible solutions. Our science teacher encourages us to do this and present our findings to the entire class (See Ediger, 2000, 244-249).

Reading Library Books in Science

An adequate number of library books need to be in the offing for students to read. These books relate directly to the ongoing science unit being taught. Thus, library books, expository in nature, need to contain relevant, vital, and important subject matter. The subject matter should be accurate and useful in problem solving. Available library books should be on different reading levels to provide for fast, average, and slow readers. The titles need to be on diverse topics so that students individually may find a book that is of personal interest and yet relates to the unit title taught in science.

The learner should choose the book to read, but the teacher may do the choosing if the student is not able to make a choice. After the student had competed reading a book, he/she my have a conference with the teacher. The latter discusses a few major ideas contained in the book, with the student.Thus, comprehension of content is discussed. The student may read aloud a selection from the library book to the teacher so that the latter may check word recognition techniques possessed by the learner as well as fluency in reading orally. An additional way to appraise comprehension of subject matter read is to have the student engage in journal writing.

There are a plethora of things to write about in journal writing after the student has completed reading a library book on science.

1. main ideas gleaned supported by relevant facts.
2. vital concepts which provide a structure for subject matter read.
3. impressions gained from reading.
4. uses to be made of content acquired.
5. projects to be developed which relate directly to subject mater read.
6. possible experiments to be performed from reading science library book content.
7. issues in science gleaned from reading to be discussed in a committee setting.
8. a list of personal choices for other science library books of related content to be read.
9. outline of content from the completed library book to be presented as a book report in a peer setting.

10. a written book report of salient subject matter form the library book read to be turned in as a requirement. One book report may be required reading every three weeks (See Jackson, 1998).

There are many entries which may be written in journal writing by the student. The author has just skimmed the surface. Journal writing may be assessed using rubrics. The rubric should have five levels , approximately, indicating achievement from the highest to the lowest level. Each level of the rubric may be written out as to what is required of the student to receive the top or other rating on the five point scale. More than one rater is preferable to notice reliability such as interrater or interscorer reliability. Raters need to base their individual journal rating on the criteria listed in the rubric. Consideration too must be given to what can be reasonably expected from a learner in journal writing. Improved understanding of science as well as better writing skills should be an end result.

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